

has five distinct broad black stripes on the upperside, and that the tawny-coloured stripes between them are narrower than the black.

(6) I described, in the year 1884 (Z. ges. Orn. i. p. 296, sp. 82), an egg of a *Casuaris* from Aru, which Mr. Rothschild has designated, with a query, as that of either *C. casuaris beccarii* ScL. (p. 117), from Vokan, or of *C. bicarunculatus* ScL. (p. 130), from Wammer and Kabroor. Since my description was published, I have been able to enquire of the collector as to the exact locality whence the specimen came, and have been told that it was from Ureiuning, on the Wanumbay River. It must therefore belong to the latter species.

(7) I cannot agree with Mr. Rothschild as to the locality of *Mansinam* (p. 141). The village on the mainland is called *Manseiman*, not to be confounded with *Mansinam* on the island of Manaswari, *Manseiman* being up the mountain—cf. my 'Neu-Guinea Tagebuch,' pp. 11 & 15, and map (1875). This, however, is of little consequence.

So far as I know, the splendid series of Cassowaries in the Turati Collection, now in the Museum of Milan, has not yet been sufficiently studied. These specimens, with their localities, would perhaps add something to our knowledge of the group, which is, even after Mr. Rothschild's admirable endeavours, far from being complete.

Royal Zoological Museum, Dresden,  
January 28th, 1901.

XIX.—*On the Habits and Haunts of the Noio or Hawaiian Noddy Tern.* By H. W. HENSHAW.

UPON much of the windward side of the Island of Hawaii the coast is bold and rugged; nor has it been entirely in vain that the north-east trades have essayed their might against the obdurate volcanic rock for centuries, as witness the many little bays and recesses which have been formed.

This rugged, lonely, surf-streaked coast is the haunt of the Noio (*Anous hawaiiensis*), which species, the Tropic-bird,

and the Ulili (*Totanus incanus*) are its sole avian inhabitants, save where the Mynah and the Domestic Dove have established colonies in the faces of the cliffs.

The shallow caverns eaten here and there into the bases of the bluffs with the more protected ledges are the chosen homes of the Noddies. Within these rocky shelters they roost securely at night, and there in summer they build their nests and lay their spotted eggs on the flat, stony shelves. The Noio is a very child of the ocean, and asks nothing more than to pass its whole existence within the sound of the surf-beaten shores.

The habit of nesting in rock-shelters and upon ledges of cliffs, long since noticed by Mr. Dole, is especially remarkable, when it is remembered that Palmer, Mr. Rothschild's collector, found the bird breeding upon the ground under bushes on Laysan and on other islands to the north-west of the Hawaiian Archipelago. Evidently the Noio has been able to conform its habits to its environment, and so lives and thrives under conditions which have repelled all others of the group.

Unlike the Terns proper, this Noddy never dives or plunges deeply into the water after its finny prey; with slow and measured wing-beats it flies just above the surface of the ocean, following the curving billows with prying eyes, and turning sharply to the right or left to seize its booty with a quick downward swoop.

Its favourite food is a long, slim, silvery minnow, known to the natives by the name of Noi Noi, in pursuit of which it makes frequent excursions off land, companies of fifty or more being often seen five or ten miles from the coast, all actively engaged in fishing. In summer its presence is eagerly watched for by the Hawaiian fishermen, since where the Noio congregates, there also the Aku or "Skip-jack" is sure to be found eagerly pursuing the same little fishes.

The surface of the Pacific near the islands is usually calm, save for a long, majestic swell, or for troubled currents among the surf-beaten rocks, and there the bird may be seen

hunting, rather than in the smooth shallow waters of the sheltered bays. In short, it appears to shun the places where Terns are generally most at home.

It fishes most actively in the early morning and late afternoon, the interval being passed at rest upon some favourite ledge.

The Noio is gentle and sociable in disposition, as indeed are most of its kind, and the members of a colony seem to dwell together in the utmost harmony. It appears to have no natural enemies except man, and, as its nesting-sites are rarely accessible, or only so under certain unusual conditions of wind and water, they are not often disturbed even by the natives.

In the olden time meat was very scarce in the Hawaiian Islands, where the largest wild animal was a rat, and the only domesticated species were the dog and the pig. I understand that then the natives used to make raids upon the Noio at night by the aid of torches, and plunder the nests of both eggs and young. Bewildered by the light, the old birds flew round and round and were easily knocked down with clubs. The flesh is tender and, notwithstanding the fish diet, is said to be not unpalatable. When molested by day, the members of a colony circle wildly about their threatened homes, uttering a harsh crik, crik; but if no real harm is apprehended, they soon recover their equanimity, and in a few moments return to their nests or perching-places. The Noio possesses the confidence born of long immunity from danger.

The writer's own experience is limited to the Island of Hawaii, but there is abundant evidence to shew that the bird is generally distributed throughout the group.

Mr. Palmer found *Anous stolidus* on French Frigate and Laysan Islands, but that bird appears to be absent from the coast of Hawaii, and may not occur, except perhaps casually, anywhere in the Archipelago. Mr. Dole's references, as indicated by Mr. Wilson, apply solely to the Noio.

I have spoken above of the nest, but in truth the little collection of rubbish gathered from the sea hardly deserves that name; it is always damp, sodden, and foul-smelling, but

even so serves to keep the eggs and newly-hatched young from the bare rock and, what is perhaps of more importance, prevents them from rolling off the sloping and insecure ledges. However, not many days pass after the Noio is hatched before it is able to look after itself. It scrambles over the rocky shelf to meet the parent bird when it comes with food, and upon detecting danger stows itself away in some crack or deep recess till reassured by the well-known summons.

Like the ordinary Noddy Tern, the Noio lays but one egg, while its breeding-season appears to be prolonged, for I have found fresh eggs as early as February 11, and have seen newly-hatched young as late as July 1. The prolongation may, in part, be due to the birds being disturbed, in part to the lack of suitable nesting-sites. The volcanic cliffs, owing to the nature of the cleavage, probably do not offer a sufficiency of suitable ledges and shelves for all the pairs, so that some have to wait their turn until later. Be the explanation what it may, in one cave that I often visited there were always fifteen or twenty pairs of birds, while I have never found more than six eggs and young at the same time.

Under these circumstances it would be interesting to discover if such colonies are not to some extent communal. It is possible that all the old birds contribute more or less to the support of the young, as they are hatched from month to month, whether they be their own offspring or those of others. Such a habit is quite conceivable in the case of a bird so gentle and affectionate as the Noio.

The eggs resemble those of other species of Noddy. The ground-colour is a rather clear greyish white, but is apt to be stained by contact with the nest to a dirty brown of varying intensity. The amount of marking varies within wide limits. Many specimens are spotted and blotched with clove-brown, which is sometimes so thickly deposited as to appear almost black. One that lies before me is heavily clouded with dark lilac, and has smaller markings of clove-brown. When overlaid with lime the markings appear purplish.

Five eggs measure :  $1.87 \times 1.37$  ;  $1.87 \times 1.31$  ;  $1.81 \times 1.25$  ;  $1.81 \times 1.37$  ;  $1.75 \times 1.38$  inch.

In colour the young birds repeat the pattern of their parents. The head and occiput are clear greyish white, even lighter than the ashy head of the adult. The lores and postorbital spaces are black. The other parts are sooty black. The legs and feet are dark brown, affording no hint of the yellow or orange hue of maturity.

XX.—*On the Anatomy of the Radiated Fruit-Cuckoo* (*Carpococcyx radiatus*). By FRANK E. BEDDARD, M.A., F.R.S.

So far as I am aware, there is no published account of the anatomy of *Carpococcyx*. Being particularly interested in the group of Cuckoos, I am glad to have this opportunity of contributing to ornithology some account of its structure, which is based upon a specimen recently living in the Gardens of the Zoological Society of London\*.

a. *External Characters.*

As in Cuckoos generally, the *oil-gland* is nude.

I counted 10 rectrices and 18 remiges. The fifth cubital remex is *not* missing.

The ventral feather-tracts in *Carpococcyx* separate from each other about halfway down the neck. On the breast the tract of each side is not more than two or three feathers wide. A small tract of feeble feathers runs thence to the hypopteron. At about the middle of the sternum the tract divides, and each half is very rapidly reduced to the width of a single feather. There is no union of the divided tracts whatever at the cloaca or anywhere else ; they are completely separate throughout.

Dorsally there is a very marked break between the cervical

\* Received August 31st, 1882. See P. Z. S. 1882, p. 358. It lived nearly 18 years in the Gardens, and died June 7th, 1900. It was fed mostly on a vegetable diet with a little scraped raw meat intermixed ; occasionally insects were given, and a dead mouse every other day.